

[REPRESENTATIVE DRAWING]

Figure 1

[SPECIFICATION]

[TITLE OF INVENTION]

Delivery apparatus for medical fluids in flat and round shape

[BRIEF DESCRIPTION OF THE DRAWINGS]

Figure 1 is a perspective view showing an example of the assembled structure of the invention.

Figure 2 is a perspective view showing another example of the assembled structure.

Figure 3 is a plane view showing affixation of a tubular-body in a stretched state.

Figure 4 is a perspective view showing the outer appearance of the assembly.

Figure 5 is a cross-sectional view showing an upper case and a lower case, connected with an intermediate-ring.

Figure 6 is a cross-sectional view of a lid.

Figure 7 is a cross-sectional view of the prior art.

<EXPLANATION OF REFERENCE NUMERALS>

10: upper case

20: lower case

30: intermediate-ring

40: valve

50: lid

[DETAILED DESCRIPTION OF THE INVENTION]

[PURPOSE OF THE INVENTION]

[FIELD OF THE INVENTION AND DESCRIPTION OF THE PRIOR ART]

The present invention relates to a delivery apparatus for medical fluids which utilizes a tubular-body, wherein the tubular-body is wound and fixed on a projecting-holder and maintains the expansion pressure of the expanding tubular-body the same for the beginning and later periods; and has a flat shape which not only makes it easy to carry but also makes it possible to provide diverse designs.

In conventional delivery apparatus for medical fluids utilizing a tubular-body, a tubular-body (300) is inserted into a pipe-conduit (200) usually furnished with a channel, whereby in a state in which the tubular-body is closely adhered to the pipe-conduit, the medical fluid injected through the pipe-conduit (400) enters into the tubular-body through the channel and causes the tubular-body, made of one layer, to expand.

Therefore, the expanded tubular-body (300) allows medical fluid to be discharged with a strong pressure in the beginning, but, as time passes, the expanded, one-layered tubular-body contracts, thereby, causing the pressure to drop, and results in a decrease in the volume of medical fluid being discharged, which is disadvantageous.

Accordingly, due to such structural shortcoming, when inserting the conventional tubular-body into the pipe-conduit, the tubular-body is in a stretched state, that is, fitted into the pipe-conduit, the tubular-body is stretched and tightly adhered to the pipe-conduit by strong pressure that is to compensate for that variation of pressure in the beginning and later periods.

However, in such case not only is there a difficulty in assembly but also there are limitations in selecting material for the tubular-body that does not change when it expands.

Moreover, another disadvantage is that it is impossible to offer variety in design since the shape of the final product is merely a simple pipe-type.

[PROBLEM TO BE SOLVED BY THE INVENTION]

Therefore, the present invention, having a tubular-body wound up in two layers on a round projecting-holder, and thereby maintaining constant pressure of the tubular body when expanded by the injection of medical fluid, in the beginning and later periods, solves, the problems of the prior arts and also makes it possible to offer a variety in design.

[DESCRIPTION OF THE PREFERRED EMBODIMENTS]

The preferred embodiments will be described in detail below referring to the attached drawings.

The embodiment of the present invention is a structure in which the upper case (10) and lower case (20) are assembled as counterparts, and such counterpart assembly enables detaching.

Additionally, being equipped with a separate intermediate-ring (30) of specific width, in between of the upper case (10) and the lower case (20), not only enables easy assembly and a variety of designs but also various adjustment of volume according to the width of the intermediate-ring.

As shown in Figure 1, this invention includes an upper case (10), wherein a projecting-holder (11) is formed in the center of the upper case (10) for the tubular-body to be wound upon, a tubular-body (1) of which both ends are connected to each other and affixed to a branch-conduit (2) by affixation member (3), in order to wind onto the projecting-holder (11), and a hose (100) is connected to the branch-conduit for the flow of medical fluid.

Additionally, the inner wall of the lower case (20) adheres as tightly as possible to the projecting-holder (11) of the upper case (10) to prevent the tubular-body (1), wound on the projecting-holder (11), from separating. An open-groove (12) which has a bore wide enough for the

branch-conduit (2) to fit is formed to affix the branch-conduit (2), and the open-groove (12) is equally divided between the upper case (10) and the lower case (20), with which it combines, and that allows for secure affixing by application of pressure.

Since this is an already known method, a variety of methods can be proposed.

Therefore, medical fluid, when injected into the hose for medical fluids (100), flows into the branch-conduit (2) and expands the tubular-body (1). Since the expanded two-layered tubular-body (1) tightly adheres to the projecting-holder (11) and winds circularly therearound, it contracts as a whole when contracting and thereby, the change of its expansion pressure in the beginning and later periods becomes reduced.

Furthermore, when an intermediate-ring of a specific width is employed between the aforementioned upper case (10) and lower case (20), it is not necessary to prepare additional upper cases (10) and lower cases (20) for situations of different injection volume of medical fluids. By varying the width of the intermediate-ring, it is easy to change its shape according to the different volumes, and thus being able to immediately deliver upon the demand of consumers is its advantage. And it is also possible to offer a variety of designs by making the intermediate-ring (30) in various colors.

Additionally, the combining method to affix the branch-conduit (30) [*sic*, (2)] is by forming fixing protrusion (2a) on the branch-conduit (2) and by forming fixing grooves (14) on the counter parts of the upper case (10) and lower case (20), which thereby allow firm affixation by combining upon applying force. And an injection-port (2b) is formed on the branch-conduit (2) and is combined with an injection-valve (40) that has one-directional flow, whereby the injection-valve (40) is exposed through a passageway hole (13) of the upper case (10) and thereafter, medical fluid is injected through the injection-valve (40) which is exposed through the passageway hole (13).

A lid (50), which opens and closes when pressed, is formed in order to cover the passageway hole (13) of the upper case (10) for preventing outside foreign material from entering.

The lid (50) used herein has a scored folding line (51), on the inside of which is formed a slot (52) of V-shape, and the inner side of the scored folding line (51) is fixed to the upper case, so that the outer side is raised to open and close, when the scored folding line is pressed, and a tip of the outer side combines with the upper case (10) having a stopper (15) to allow the passageway hole (13) to open and close.

There is a variety of known methods for the manufacture of a stopper, wherein the stopper can be formed on the lid.

The branch-conduit (2), to which both ends of the tubular-body (1) is connected and fixed, is made out of material that does not expand due to the injection of medical fluids. A variety of known methods can be used to affix the tubular-body (1) connected to such branch-conduit (2).

However, affixing with an additional affixation member (3), with double sheathing, if possible, is necessary in order to prevent it from detaching or cracking, while in a fixed state, due to expansion pressure, and such double sheathing is possible whether its material is made of the same or a different material as that of the tubular-body.

Additionally, to prevent detaching, on the branch-conduit (2) is formed a recess groove (2c) which is sufficiently large enough to allow the affixation member (3) to be inserted through, and on the recess groove is further formed a rabbet groove (2d), which a projecting ring (31), formed on the affixation member, is fitted into and affixed, and that prevents detaching.

Furthermore, by forming the affixation member in two-layers, and in order to induce an elastic operation in a situation where the affixation

member is made out of stiff material, and by having the inside of the affixation member incised and the outside not incised, enables solid affixation.

Additionally, when such affixation member is double-sheathed, using the same material as that with which the tubular-body is made, and afterward is also fixed using a fixing band, it has the same effect of affixation.

When pressure is applied for affixing, the skin of part of the tubular-body becomes thin, which could expand and crack when pressure is delivered for injection of medical fluid. Double sheathing can solve such a problem.

[EFFECTS OF THE INVENTION]

As stated above, the present invention enables the discharge of a specific and constant volume of medical fluids because a two-layered tubular-body is wound on a projecting-holder, which reduces the change in expansion pressure. Having the tubular-body wound up allows offering a variety in design. The utilization of an intermediate-ring allows providing a variety of products just by exchanging the intermediate-ring for different capacity volumes of the tubular-body.